FIELD NOTES
from a
CATASTROPHE
MAN, NATURE,
AND CLIMATE CHANGE

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Read by Hope Davis
1. The extent of the Arctic's perennial sea ice has declined dramatically in recent years. Credit: F. Fetterer and K. Knowles, Sea ice index, National Snow and Ice Data Center.
2. The world’s first ratio spectrophotometer, built by John Tyndall, was used to measure the absorptive properties of gases. 
Credit: Philosophical Transactions, vol. 151 (161).

3. The Keeling Curve shows that CO₂ levels have been rising steadily since the 1950s. Credit: Scripps Institution of Oceanography.
4. The Greenland record reveals that temperatures have often swung wildly.  
   Credit: The Two-Mile Time Machine, Princeton University Press, after K.  

5. The critical photoperiod for Wycomya smithii has declined markedly  
   over time. Changes are most dramatic at higher latitudes. Credit: After W.  

CHRONOLOGY

1769: James Watt patents his steam engine.
   Atmospheric CO₂ levels are ~ 280 parts per million.

1859: John Tyndall builds the world’s first ratio spectrophotometer; tests the absorptive properties of atmospheric gases.

1895: Svante Arrhenius completes his calculations on varying CO₂ levels.
   Atmospheric CO₂ levels are ~ 290 parts per million

1928: CFCs are invented.

1958: CO₂ measuring equipment is installed at the Mauna Loa Observatory.

1959: CO₂ levels stand at 315 parts per million

1970: Paul Crutzen warns that human actions may damage ozone layer.

1979: The National Academy of Sciences issues its first major report on global warming: “We may not be given a warning until the CO₂ loading is such that an appreciable climate change is inevitable.”
   CO₂ levels reach 337 parts per million.

1987: The Montreal Protocol is adopted; phaseout of CFCs begins.

1988: The Intergovernmental Panel on Climate Change is established by the World Meteorological Organization and the United Nations Environment Programme.

   The U.S. Senate approves the Framework Convention by unanimous consent.
   CO₂ levels reach 356 parts per million.

1997: The Kyoto Protocol is drafted.

1998: Average global temperatures for the year are the warmest on record.

2000: Presidential candidate George W. Bush calls global warming an “issue that we need to take very seriously.” CO₂ levels are measured at 369 parts per million.

2001: The IPCC issues its Third Assessment Report: “Most of the warming observed over the last fifty years is attributable to human activities.”
A report by the National Research Council requested by President Bush states, “Greenhouse gases are accumulating in Earth’s atmosphere as a result of human activities, causing surface air temperatures and subsurface ocean temperatures to rise. Temperatures are, in fact, rising.”
President Bush announces that the United States is withdrawing from the Kyoto Protocol.
Third warmest year on record.

2002: Larsen B ice shelf collapses.
Second warmest year on record, tied with 2003.

2003: Senator James Inhofe, chairman of the Committee on Environment and Public Works, says he has “compelling evidence that catastrophic global warming is a hoax.”
The American Geophysical Union issues a consensus statement asserting: “Natural influences cannot explain the rapid increase in global near-surface temperatures.”
CO₂ levels reach 375 parts per million.

2004: Kyoto Protocol is ratified by Russia.
Fourth warmest year on record.

2005: Extent of melt on the Greenland ice sheet reaches a record maximum.
Arctic sea ice reaches a record minimum; researchers warn sea could be ice-free in summer “well before the end of this century.”
Kyoto Protocol goes into effect.
The National Academies of Sciences of the eight major industrialized nations issue a joint statement: “The scientific understanding of climate change is now sufficiently clear to justify nations taking prompt action.”